The Magic Lever

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Three years ago, the Bank of England set out to calculate a figure that does more than any other to shatter banking's preferred image of itself. The figure made its first, understated appearance in March 2010 when Andrew Haldane, the Bank's Executive Director for Financial Stability, included it in a talk in Hong Kong, then reappeared later that year in a chart buried at the back of the December issue of the Bank's *_Financial Stability Report_*. The figure was the size of the subsidy that taxpayers give to British banking just in virtue of being available to bail out banks if things go badly wrong. It was calculated by working out the value to banks of the difference between the two ratings now typically given to them by credit rating agencies: one of the ratings takes likely government support into account; the other, lower rating does not.

The Bank put the figure for 2009 at £107 billion. It didn't attract much attention, but it should have. It's more than the government spent that year on social security or on education, and almost as much as it spent on health. The Royal Bank of Scotland, however, did notice, and grasped the threat posed by the figure to the image of banking. It commissioned its own analysis from the economics consultants Oxera, who took a different approach, treating government support as what traders call a 'put option' (in effect, insurance) on the aggregate assets of the banking system, and using the theory of such options to work out the value of the put. Oxera estimated the annual subsidy at £5.9 billion.

That's still a pretty handy sum: it's more than the government spends on Jobseeker's Allowance, or – if you prefer – you could use it to pay for the BBC **and** throw in the wage bill of the Royal Navy. Unfortunately, Oxera's method involved questionable assumptions about interest rates and the exact nature of the put option,

and further analysis by economists at the Bank of England suggests that the true value of the option (and therefore of the taxpayer subsidy) for 2010 lay between £30 billion and £120 billion.

There's nothing specific to the UK about the subsidy, **other than its size relative to the UK economy, which results from the fact** that our banks are **very large** and two of the biggest, Lloyds and the Royal Bank of Scotland, remain wards of the state. The financial news service Bloomberg, drawing on work by the International Monetary Fund, estimates the US subsidy at $83 billion a year. Senators Sherrod Brown (Democrat, Ohio) and David Vitter (Republican, Louisiana) have asked Congress's investigative arm, the Government Accountability Office, to come up with a more authoritative figure. No one to my knowledge has done the equivalent calculation for the countries of continental Europe, but subsidies there are likely also to be gigantic.

I don't object in principle to taxpayer subsidies; I work in a sector, higher education, that still receives large amounts of public money. And in practice, the subsidy to banking is an insurance policy that only occasionally results (as it did in 2008) in direct cash injections. The subsidy doesn't go directly into bankers' pockets, and because it makes it cheaper for banks (with their current, debt-laden balance sheets) to borrow to fund their loans, it must reduce somewhat the interest rates on those loans. But it is reasonable to ask whether an activity such as banking, in which participants can become enormously wealthy, should receive a subsidy on this scale.

At least as important is the way in which the subsidy generates a systemic economic effect with huge consequences for the behaviour of the banking sector. Let's compare a bank to an individual homeowner. Her flat is an 'asset': she can live in it, rent it out, sell it. A bank's assets include the buildings it owns, but those are less

significant than its financial assets: the loans it has made and the bonds or other financial securities it has bought. They are assets because they generate income for the bank. Most homeowners fund their purchase of a flat or house with a mixture of a mortgage (their 'debt') and a deposit (their 'equity'). Similarly, banks raise the money to acquire their assets (to make their loans or purchase securities) with a combination of debt and equity. The latter is the money invested in the bank by its shareholders, together with any profits it has retained from its activities over the years.

The insurance that taxpayers provide to banks has the effect of making it seem to bankers that it is much cheaper for them to take on debt to fund their assets than to raise cash from shareholders, for example by issuing new shares. Taxpayer bail-outs don't protect banks' shareholders from swingeing losses: the shares of Lloyds and RBS, for example, are now worth a tiny fraction of their value prior to the crisis. But because of the bail-outs, those who lent to banks in Europe and the US have generally got their money back. Because investors have reason to hope this will continue to be the case, they are prepared to lend banks money on terms far more favourable than they would insist on if banks genuinely were ordinary commercial enterprises.

In part because debt seems cheaper than equity, the composition of banks' balance sheets has shifted drastically over the decades.**[1] In the 1880s, US banks had average levels of equity of just below 25 per cent, and UK banks of around 15 per cent. By the time of the onset of the crisis in 2007, equity levels had fallen to small fractions of those numbers, and they remain well below them today. The consequence is that the banking system has become inherently more fragile. The analogy between a bank and a homeowner shows how. Imagine you have bought a flat for £100,000 (the chance would be a fine thing, but it simplifies the arithmetic), with a deposit

('equity') of £20,000 and a mortgage of £80,000. If house prices go up 20 per cent, you've doubled your equity. (In that simple sum lies the fatal fascination of the British with property.) If house prices go down, your equity loses its value, but it can absorb a fall of up to 20 per cent before you are in negative equity, with your flat worth less than your debt.

Now consider what happens if you manage to get a 95 per cent mortgage and so have equity of only £5000. You will be in a position to earn a very high return on your equity: an increase in house prices of as little as 5 per cent doubles it. Being in the equivalent of that position as a senior banker can be very attractive when your performance is judged – as, alarmingly, it still is – by your bank's return on equity. The easiest way to boost that return is to 'lever up', as people in finance put it: to increase the ratio of the bank's debt to the equity it holds. Haldane, speaking in London in July 2010, suggested that levering up explains almost all of the increased return on equity achieved by British banks in the run up to the crisis.

However, the magic of leverage works both ways. If you have only 5 per cent equity in your flat, even a small decline in house prices – anything more than 5 per cent – plunges you into negative equity. Negative equity is nasty for a homeowner, but for a bank it is potentially fatal. It means that a bank's assets are worth less than its debts: in other words, that it is insolvent.

By the time of the crisis, many of the world's leading banks were in the position of the homeowner with only 5 per cent equity, if not worse. Going through the balance sheets of Europe's leading banks for December 2006 is a chilling experience: there – in black and white, but entirely unnoticed back then, in the last months of pre-crisis complacency – is the evidence of their fragility.

At the end of 2006, the Royal Bank of Scotland had on its balance sheet assets worth in total £848 billion, the equivalent of 64 per cent of UK GDP. (That's what it means to be a giant bank, and RBS still had another year of asset growth to come.) The bank's balance sheet, however, records equity of only £38 billion, 4.5 per cent of its total assets. Lloyds had an equity level of 3.3 per cent, and Barclays 2.7 per cent. Deutsche Bank had 2.9 per cent equity; UBS 2.3 per cent. (It's easy enough to work out the numbers for yourself. Nearly all the big banks' annual reports are on the web. Don't be swayed by the bank's own calculations of capital ratios: go directly to the balance sheet, find the total equity and total assets, and divide. I have to warn you that you may not find the exercise entirely reassuring.)

Equity of less than – sometimes much less than – 5 per cent was in the case of many banks simply too little to allow them to absorb the losses incurred in the crisis. Between June 2007 and June 2009, the first phase of the global banking crisis, the aggregate market value of the assets of the UK's big banks fell (on the basis of Bank of England figures analysed by Oxera) by 5.3 per cent. That was enough to push Lloyds and RBS over the brink and take Barclays uncomfortably close to it. A robust banking system should be able to absorb a 5.3 per cent decline in the value of its assets. The UK's banking system a hundred years ago would have been shaken but could have survived: the financial historian David Sheppard has calculated that the system's average level of equity in 1908 was 11.2 per cent. Bank shares would on average roughly have halved in value; some weaker institutions might have failed, but bail-outs on the scale of 2008 would not have been needed.

The first clear sign that the levels of equity in the West's banking system had become inadequate came in the early 1980s, when the solvency of several large US banks was threatened by defaults or the prospect of defaults on their international

loans, especially to Argentina, Brazil, Chile and Mexico. Congress responded with the 1983 International Lending Supervision Act, which **among other measures instructed banking regulators to enforce minimum capital requirements for US banks with overseas exposures.**

However, bank lobbyists persuaded Congress that if the US set those requirements unilaterally, other international banks, especially Japanese banks, would be able to undercut US banks by offering loans at lower rates of interest. Paul Volcker, then chair of the board of governors of the Federal Reserve, was given the task of negotiating international capital requirements. At a private dinner in London in September 1986 with Robin Leigh-Pemberton, governor of the Bank of England, and three of his officials, Volcker found he had an ally. Margaret Thatcher's 'big bang' reforms to the City of London were due to come into effect the following month, and the Bank felt the need to move from its traditional 'gentleman's club' supervision of banks to more formal rules. The other members of the Basel Committee on Banking Supervision, which brings together representatives of the central banks and regulatory bodies of the leading industrial countries, were then pressured or persuaded into agreement, a process described by Charles Goodhart in his book on the history of the committee.**[2] At the core of the 1988 Basel Capital Accord ('Basel I', as it is now known) is an apparently straightforward rule, named for the then chair of the Basel Committee, the Bank of England's Peter Cooke. It states that the Cooke ratio, between a bank's 'capital' and 'risk-weighted assets', must be at least 8 per cent.

This figure wasn't the result of any explicit cost-benefit analysis: it appears simply to have been chosen after an examination of the actual ratios at the world's

leading banks. The 8 per cent ratio 'largely fell out of the data', Goodhart writes, 'since the aim was to push up ratios somewhat everywhere, but not to do so by so much as to make it too difficult for large international banks to comply'.

The Cooke ratio was only apparently straightforward in that both its numerator ('capital') and its denominator ('risk-weighted assets') encode the stuff of decades of complex struggle among regulators and between regulators and banks. Capital wasn't defined simply as equity: various forms of debt instrument, for example, were allowed to count as well. Even more important – in the sense that it still shapes the day-to-day behaviour of banks – was risk weighting. If a bank made a loan to a non-financial corporation, that loan had a 100 per cent risk weight (it counted fully in the calculation of the Cooke ratio). However, under the Basel I rules, if a bank lent money to another bank domiciled in an OECD country, the loan had a risk weight of 20 per cent: only a fifth of its value counted. Also, a bank could buy as many bonds issued by OECD governments in their own currencies as it wished without affecting its Cooke ratio in the slightest, even if that government was well on the way to becoming a major debtor. The bonds of, for example, Greece (an OECD member since 1961), Italy (1962) and Japan (1964) were 'zero-weighted' under Basel I.
The idea of risk weighting seemed sensible, even necessary, as a guard against banks' being tempted simply to accumulate the riskiest and thus highest-yielding assets. However, banks' aversion to equity created a huge incentive for banks to reduce the risk weights of their assets even in ways that did not in fact reduce actual economic risks. As my colleagues at the Centre for Research on Socio-Cultural Change at the University of Manchester have emphasised in their book, **After the Great*

Complacence, much of what has counted over the past 25 years as 'financial innovation' has been a response to incentives of that sort. [**3]

Consider, for example, securitisation, a technique that rapidly gained popularity in the 1980s and 1990s. A bank creates a separate legal entity (called a special purpose vehicle), which then buys from the bank a pool of the loans that it has made, raising the money to do so by selling investors securities that are claims on the income stream from those loans. Those securities are structured into a set of classes called tranches: the highest tranche is the safest because its holders have the first claim on the income stream; the lowest tranche is the riskiest. Securitisation can make banks' holdings of loans less risky. However, in early securitisations, a bank would often retain the lowest tranche in order to persuade outside investors to buy the higher tranches, with the consequence that the bank would still bear most or all of the anticipated losses on the loans. The economic risks it faced were therefore by no means eliminated, but because the equity tranche would be much smaller in size than the entire pool of loans, the bank's total of risk-weighted assets would fall, and the amount of equity it required would be reduced. In later cases, banks often sold the equity tranche as well, but started to take on a variety of 'off-balance-sheet' commitments to special purpose vehicles, commitments that didn't add to risk-weighted capital but were to prove very costly in the crisis.

The entrenched aversion to equity within banking means that whenever I've spoken to someone involved in securitisation they've always taken for granted the need to keep risk weights as low as possible. To regulators, however, securitising loans while retaining much of their risk smacked of 'regulatory capital arbitrage': self-interested exploitation of the detail of the Basel rules.

Concern about regulatory arbitrage helped drive the search for a follow-up to Basel I. After prolonged negotiations, the Basel II agreement started to take effect in the mid-2000s. (Basel agreements have no legal standing until turned into national or EU regulations; the US has never fully implemented Basel II.) The new agreement supplemented simple rules akin to those in Basel I with more elaborate measures of risk. The goal, one person involved in the research underpinning Basel II told me, was to make the equity requirement what 'a bank would want to hold itself to if it was doing things sensibly', in which case there would be incentive to circumvent the rules. 'The view was that . . . you would never be able to plug the dyke against financial innovation . . . that regulations could never be so precise that there were no ways around them if the institutions felt they had a strong incentive to do it . . . We in the UK were reasonably conservative on lots of different issues, but the Americans were kind of convinced about the . . . correctness of their bankers' own assessments of risk . . . it was kind of low-level regulatory capture . . . not even driven by boozy lunches, just driven by the fact that they [US regulators] were having too much contact with, you know, the masters of the universe.'

Banks judged by their regulators to be sufficiently sophisticated were allowed considerable freedom to use their own analyses of risk in calculating their capital requirements. A change to Basel I in 1996, the Market Risk Amendment, permitted them to do that for the risks caused by fluctuations in interest rates and market prices, and Basel II allowed them to do it for credit risk: the risk of borrowers defaulting. Although Basel II lays down the credit-risk models to be used, it gives banks latitude in how exactly to employ them, and in particular allows them to use their own data sets to calculate crucial risk parameters.

Recent investigations by regulators have revealed very large differences in the ways banks assess the same or similar risks. Some of the differences are the result of the directives given by different national regulators, but it's hard to escape the suspicion that banks continue to choose their methods so as to reduce risk weights and therefore, the amount of equity they are required to hold. Even some senior bankers admit the process is opaque. In January 2012 Vikram Pandit, then chief executive of the US banking giant Citigroup, wrote in the **Financial Times*: 'Capital requirements are not as transparent as many presume . . . Without knowing what [a bank's] underlying assets are (only insiders and select regulators know that), outsiders, including most investors, cannot properly assess how that institution calibrates risk.'

The cumulative result of Basel I, the Market Risk Amendment and Basel II was fragile banks with only thin slivers of equity. The crisis has, of course, generated a raft of proposals for making banking safer. Some of these involve **simplifying** the structure of banking, for example by separating (or at least creating a 'firewall' between) riskier investment banking and the more mundane commercial activities essential to the smooth day-to-day running of economies. Other proposals include 'living wills' – preprepared legal plans that make it easier to wind up an insolvent bank – as well as measures to restrict banks to trading on behalf of their clients (effectively, a ban on 'proprietary' trading designed simply to earn the bank profits) and to limit bonuses, making them more dependent on the medium-term performance of the bank.

But the most concerted international effort has gone into a new Basel agreement. Basel III broadens the measurement of risk, in particular the risk associated with financial derivatives. It tightens the definition of 'capital', insisting that 4.5 per centage points of Cooke's 8 per cent ratio must be made up of equity.

There are also two crucial additions to the Cooke ratio. The first is a 'capital conservation buffer' of a further 2.5 per centage points of equity. Once the ratio of a bank's capital to risk-weighted assets falls below 10.5 per cent it becomes subject to gradually increasing restrictions on bonuses to its employees and dividends to its shareholders. Second, banks judged to be of global systemic importance have to have an additional layer of equity of up to 2.5 per centage points. In total, a very big bank must therefore have equity of at least 9.5 per cent of its risk-weighted assets.

Basel III is likely to be implemented in the European Union without too much watering down: the necessary legal instrument, the Capital Requirements Directive IV, is close to being agreed. It is to be hoped that the US will follow suit, but even if it does, it would be rash to conclude that the fragility of banking will then have been overcome and the need for taxpayer subsidies removed. Consider the new demand for equity**: it is for up to 9.5 per cent of a bank's risk-weighted assets, not of its total assets. Because many assets have risk weights well below 100 per cent, the former usually add up to no more than a third to a half of total assets.** So it's perfectly possible for a bank to comply fully with Basel III and still have a ratio of equity to total assets of less than 5 per cent. Such a bank would still be poorly capitalised by historical standards, still likely to be pushed into insolvency or taxpayer bail-out by losses of no more than the 5.3 per cent average suffered by British banks in the crisis.

**Can the banking system return to the levels of equity of the 1880s or 1900s? Any banker will tell you – it's one of the few points on which they all agree – that doing so would be enormously expensive. Banks would have to cut their lending drastically and any remaining loans would have to be at very high rates of interest;

any hope of the West climbing back out of recession would be destroyed. There can be little doubt that politicians take heed of such opinions. Because of the known vulnerability of risk weighting to regulatory arbitrage, the drafters of Basel III have proposed a backstop known as the 'leverage ratio', a minimum capital ratio (of 3 per cent) in which the denominator is not just risk-weighted assets but total assets and exposures. Because 3 per cent is a fairly low requirement, both the UK Independent Commission on Banking and the Parliamentary Commission on Banking Standards have proposed a tougher minimum for British banks of 4 per cent. George Osborne has rejected the proposal.

For all its seeming plausibility, the bankers' view that equity is inherently expensive is fiercely contested by a number of economists. Until now, the controversy has been subterranean – pursued, if anywhere, in the letters pages of the **Financial Times* – but it has been put more firmly into the public domain by **an uncompromising** new book by Anat Admati and Martin Hellwig, **The Bankers' New Clothes: What's Wrong with Banking and What to Do about It*.**[4] At the core of the debate is the validity of one of the fundamental results of modern financial economics, the Modigliani-Miller theorem.

In the early 1950s, Franco Modigliani and Merton Miller were economists in the newly established business school at the Carnegie Institute of Technology (now Carnegie Mellon University) in Pittsburgh. Politically, they were quite different: Modigliani was a Keynesian and had come to the US as a refugee from Italian Fascism, while Miller was a Chicago School free-market enthusiast. But they shared an impatience with colleagues – such as the business school's best known member,

organisation theorist Herbert Simon – who they felt paid insufficient attention to fundamental economic processes.

The question Modigliani and Miller addressed was whether the balance between debt funding and equity funding chosen by a firm affects its overall costs. Their conclusion – the Modigliani-Miller theorem – is that, at least under idealised market conditions, it does not. Yes, equity is more expensive than debt (even without taxpayer insurance of the debt) because it is riskier from the investor's viewpoint: debt holders take losses only once equity holders have been wiped out. But there's an opposing effect (let's call it the 'Modigliani-Miller offset'). As the proportion of equity funding goes up, its riskiness goes down, because there's more equity to absorb losses. The rate of return demanded by equity investors therefore falls, because investors will accept a lower return on less risky shares. Modigliani and Miller showed that the two effects balance out exactly: it may be counterintuitive, but the mix between equity and debt chosen by the firm makes no difference at all to its capital costs.

Modigliani and Miller knew that their theorem rested on assumptions that weren't literally true. When I interviewed him about this work in 2001, shortly before he died, Modigliani recalled that he first announced the theorem to a class he was teaching, then told them: 'I don't believe it.' Among the idealised conditions assumed in their original analysis was, for example, that there were no differences between the tax treatment of the interest payments firms make on their debt and the dividend payments they make to equity holders. In actuality, interest payments were and are tax-deductible and dividend payments are not. Nevertheless, Modigliani and Miller believed they had identified an important economic mechanism, and all the financial

economists I know agree that the Modigliani-Miller offset is a real effect. The controversy between economists and bankers boils down to how big the offset is.

The bankers who regard increased levels of equity as prohibitively expensive seem implicitly to be positing that the offset is zero: that the return on equity that investors demand would remain the same no matter how much equity a bank raised. Admati and Hellwig think that view is wrong. They accept there may be 'market frictions' that stop the Modigliani-Miller offset being total, but believe those frictions in no way justify the current low levels of equity.

Admati and Hellwig also distinguish sharply between two senses of the word 'cost' when referring to the ways that banks fund themselves: the private cost, borne directly by the banks; and the social cost, which includes the cost of bank failures and bail-outs. It's perfectly possible, they suggest, that the social cost of equity isn't any bigger than that of debt.

In 2011, a team at the Bank of England led by David Miles (an external member of the Monetary Policy Committee) estimated the size of the Modigliani-Miller offset for UK banks at 45 per cent. If that's right, bankers are correct in thinking that raising additional equity would be more expensive than taking on debt, though only by just over half as much as they seem to think. Crucially, however, Miles and his colleagues also estimated the benefit of increased levels of equity: the reduced probability of banking crises. Basel III, they conclude, sets equity levels 'well below what the results suggest is optimal'. Something around twice the Basel III equity requirements (in other words, around 20 per cent of risk-weighted assets, or about 10 per cent of total assets) is what's needed to achieve the best balance of costs and benefits. With those levels of equity, banks could start to seem quite different from today's fragile institutions; banks with the levels called for by Admati and Hellwig (between 20 and

30 per cent of total assets, several times the Basel III requirement) certainly would. The state would still have to stand behind the banking system – unthinkable catastrophe is always possible – but the system could be robust enough to survive a repeat of imaginable disasters such as a 5 per cent loss across the system's assets, and the taxpayer subsidy would therefore be much lower.

Suppose a new international agreement – 'Basel IV' – were to demand that banks move to substantially higher equity levels, or even that individual countries did so. (Switzerland, which shares with Britain the problem of having banks that are huge relative to the size of its economy, is already insisting on capital ratios that are tougher than Basel III.) How feasible would it be for banks to meet increased requirements for equity without fresh injections of state capital? The fundamental problem is that the institutional investors who buy big blocks of bank shares were badly burned by the crisis (debt holders, remember, got bailed out, but not shareholders). They fear that if they put their money into buying new shares, they won't be rewarded with a commensurate increase in the value of their holdings: new equity capital might be swallowed up by losses that banks haven't yet owned up to, or might simply make existing bank debt safer without making their shareholdings worth more. More generally, there's widespread distrust among investors of banks and their opacity. 'It is enormously difficult for outsiders to understand what is going on in banks,' one investment analyst told **Risk* magazine. 'How can I forecast earnings if I don't understand the balance sheet?' Banks that need to raise large amounts of new equity from investors at a reasonable price may have to simplify their business models, an outcome that would be desirable in any case, given the contribution that complex products and processes made to the crisis.

A surprising amount, it should be said, could be achieved without raising new equity. Banks continually leak money, especially via bonuses to their staff and dividends to shareholders. (Admati and Hellwig point out that the dividends paid out by US banks in 2007 and 2008 amounted to around half the bail-out funds they needed just a few months later.) If profitable banks simply replaced cash bonuses and dividends with new shares they would, over a period of a decade or so, bolster their equity levels considerably.

I'd even be prepared to make my own modest contribution to the process. I own 51 shares of Lloyds Banking Group, which I inherited from my mother. My parents were teachers in the little village of Golspie, on the North Sea fifty miles north of Inverness. Having reached adulthood during the Great Depression, they feared debt and were diligent savers. The grey stone house I was brought up in was rented, cheaply, from Sutherland County Council. My parents took on a mortgage only when they were well into their fifties, and while I don't know how big a deposit they put down, I wouldn't be surprised if it was as much as 50 per cent. My mother received the shares I now own when the Halifax Building Society demutualised in 1997. Its merger with the Bank of Scotland turned them into HBOS shares, and the latter's near-failure in 2008 made them shares in Lloyds.

Lloyds is now headed by António Horta-Osório, who just over a year ago returned to this very public role after **the effect of overwork on** his health had been widely discussed in the financial press. After several nights entirely without sleep, he had taken a break from work to check into the Priory. Now back at his desk, he seems **committed to** repairing his damaged bank. I promise you this, Mr Horta-Osório: if you want to raise more equity to make your bank safer, I'll add to my little stake. In

return, though, I ask that you pay as little cash in bonuses as you can, and don't give me any cash dividends, not now, and not any time soon.

[1] Andrew Haldane wrote about this in the *LRB* of 23 February 2012

2 **The Basel Committee on Banking Supervision: A History of the Early Years 1974-1997* (Cambridge, 624 pp., £99, 2011, 978 1 107 00723 9

3 Ewald Engelen, Ismail Ertürk, Julie Froud, Sukdev Johal, Adam Leaver, Michael Moran, Adriana Nilsson and Karel Williams, **After the Great Complacence: Financial Crisis and the Politics of Reform* (Oxford, 304 pp., £25, 2011, 978 0 19 958908 1.

[4] Princeton, 392 pp., £19.95, February, 978 0 691 15684 2.